

Headquarters U.S. Air Force

Integrity - Service - Excellence

External Sustainability Factors and Risk Assessment

Sustaining Mission – Sustaining Community

**Year of the Air Force
Family**



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17 June 2010**

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- **Sustainable Installation Definition**
- **Study Methodology**
- **Solution Architecture**
- **Current Process**
- **Literature Search**
- **Factor Considerations**
- **Study Products**
- **Challenges**
- **Related work: Compatibility issues for ranges and airspace**
- **Discussion**



Sustainability Assessment Process

■ Context – AF Definition of a Sustainable Installations:

"A sustainable installation efficiently supports current operations with minimal impact on the built and natural environment without compromising the ability to meet future mission requirements."

- A sustainable installation is supported by a planning process that takes a holistic view of the interactions and interrelationships of the natural and built environment and considers both **internal and external** (inside and outside the fence) stakeholders and issues**



Methodology Phases

Problem Identification

- Define End State
- Develop an Architecture

Discovery

- Understand the AF "As Is" processes
- Research Similar Systems
- Understand data sources and collection difficulties
- Obtain Approval for Next Steps

Prototype Output Form and Information

- Identify Key AF Factors
 - Installations
 - MAJCOM
 - HAF Staff
- Identify sustainment factors important to others
- Prepare prototype output
- Identify development limitations and costs

Obtain Approval to Develop Initial Product Set

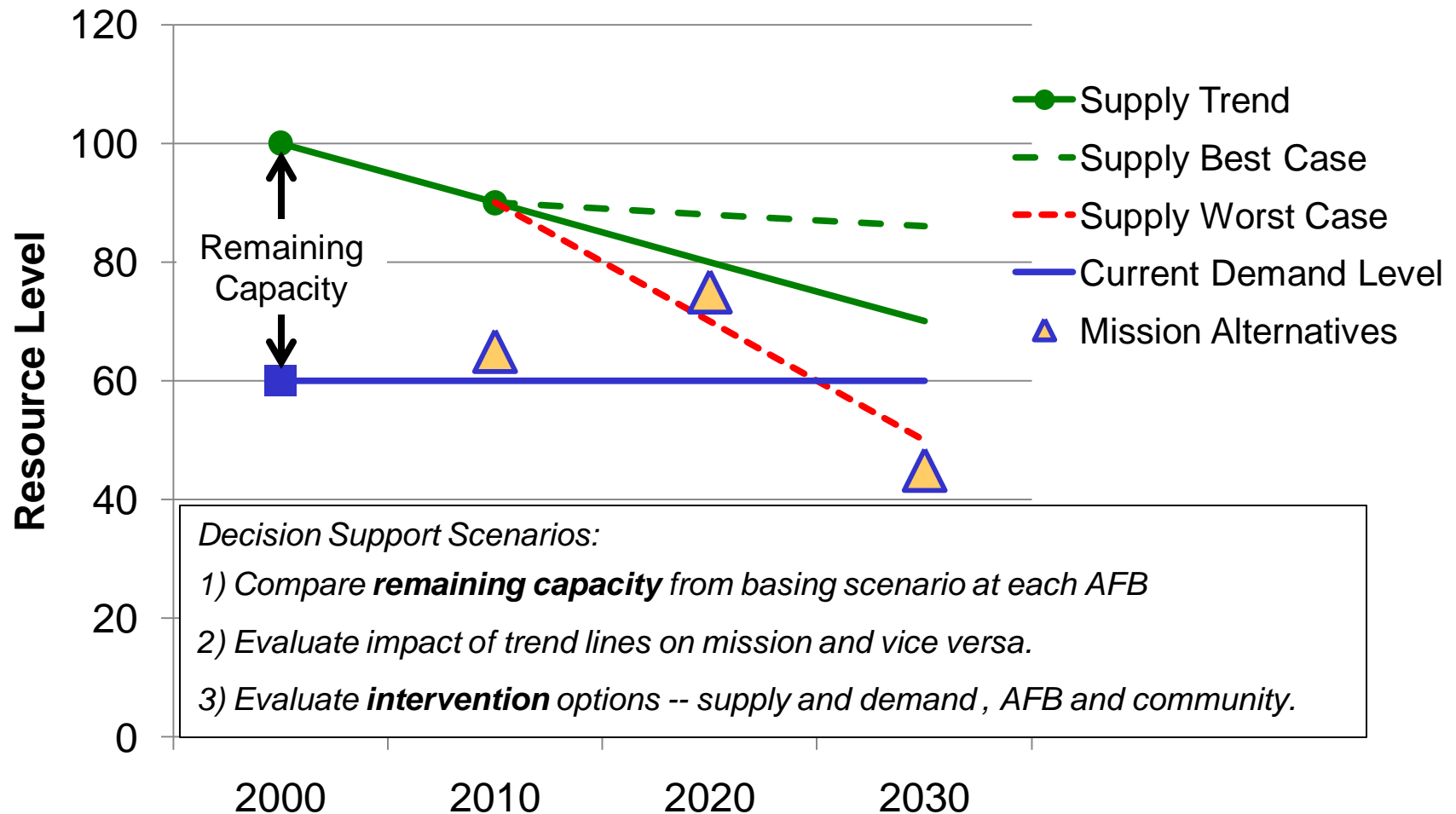
Production

- 5 Information Papers
- Supporting Analysis
- Recommendations for Way Forward
- Leadership Briefings



The Ideal End State Analysis Capability

Evaluating Supply/Demand Scenarios (Notional)





Building to the Solution Architecture

Current State

- Limited database(s)
- Limited sources of Information that are:
 - Accurate
- Limited analysis concerning external factors enhancing/inhibiting mission impacts
- Profile of selected negative interactions
- No Air Force interface with IT systems

Transitional State

- National and Air Force database(s)
- Information that is:
 - Accurate
 - Complete
 - Relevant
- Profile of key mission impacts
- Profile of key interactions
- Easily shared with NexGen IT

End State

- National database(s)
- Information that is:
 - Accurate
 - Complete
 - Relevant
 - Updated
 - Optimal ROI
- Complete profile of mission impacts
- Complete profile of interactions
- Easily shared with NexGen IT

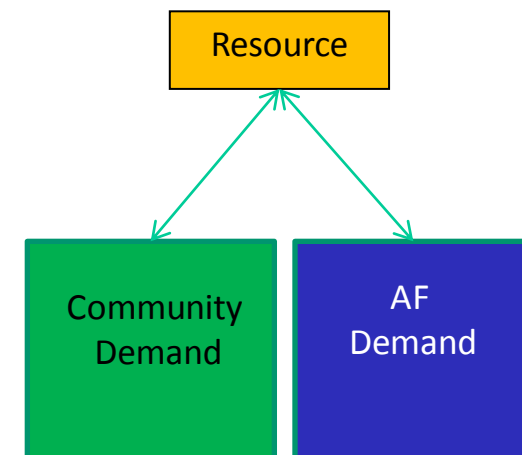


Resource/Issue Sustainment Scenarios

Alternative Scenarios

Context

Factor Time	Current Supply or Issue	Future Supply or Issue
Current Operations	Scenario 1	Scenario 3
Future Operations	Scenario 2	Scenario 4

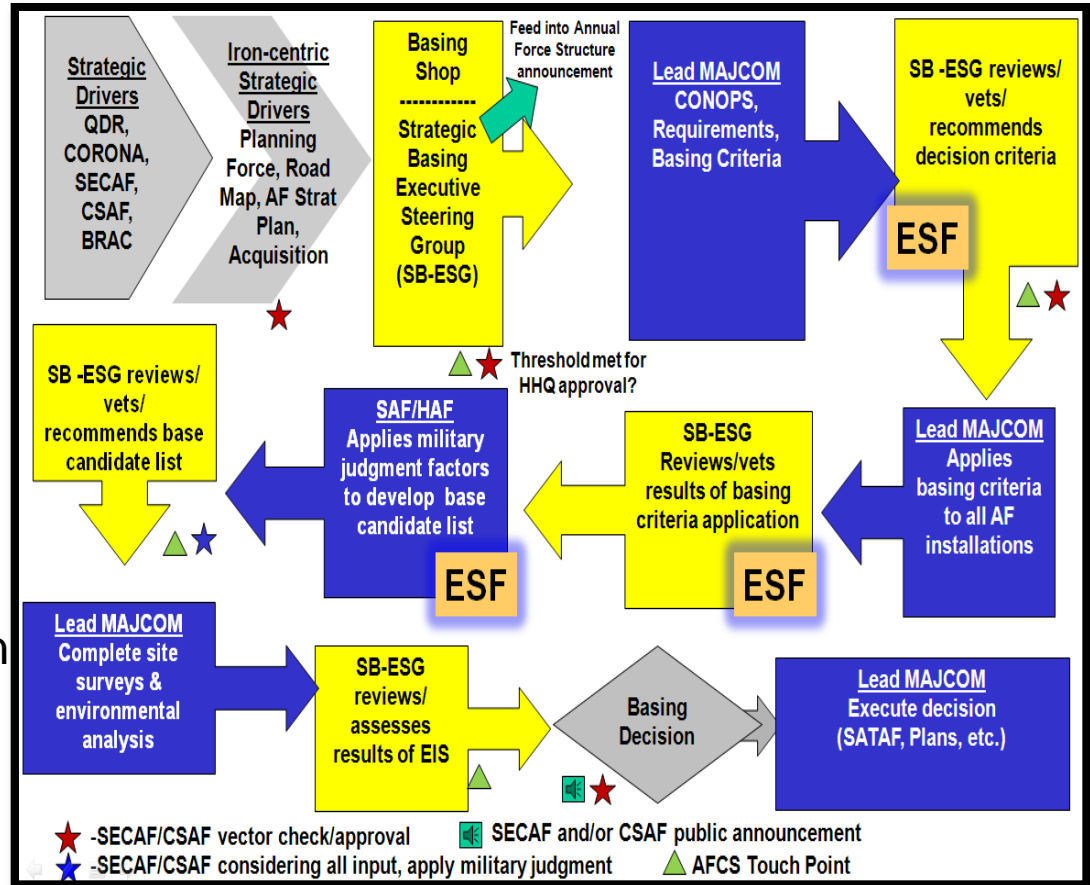




Current External Factor Considerations

Current External Factors Considered by A8

- Endangered Species
- Cultural Resources
- Encroachment
 - Noise
 - Accident Potential Zones
 - Imaginary Surface
- Spectrum Availability and Non Interference
- Cost of Living Index
- Selected issues associated with Medical, Schools, Housing, and Services



ESF - External Sustainment Factors

Literature Review: Selected Documents

Scope of Work

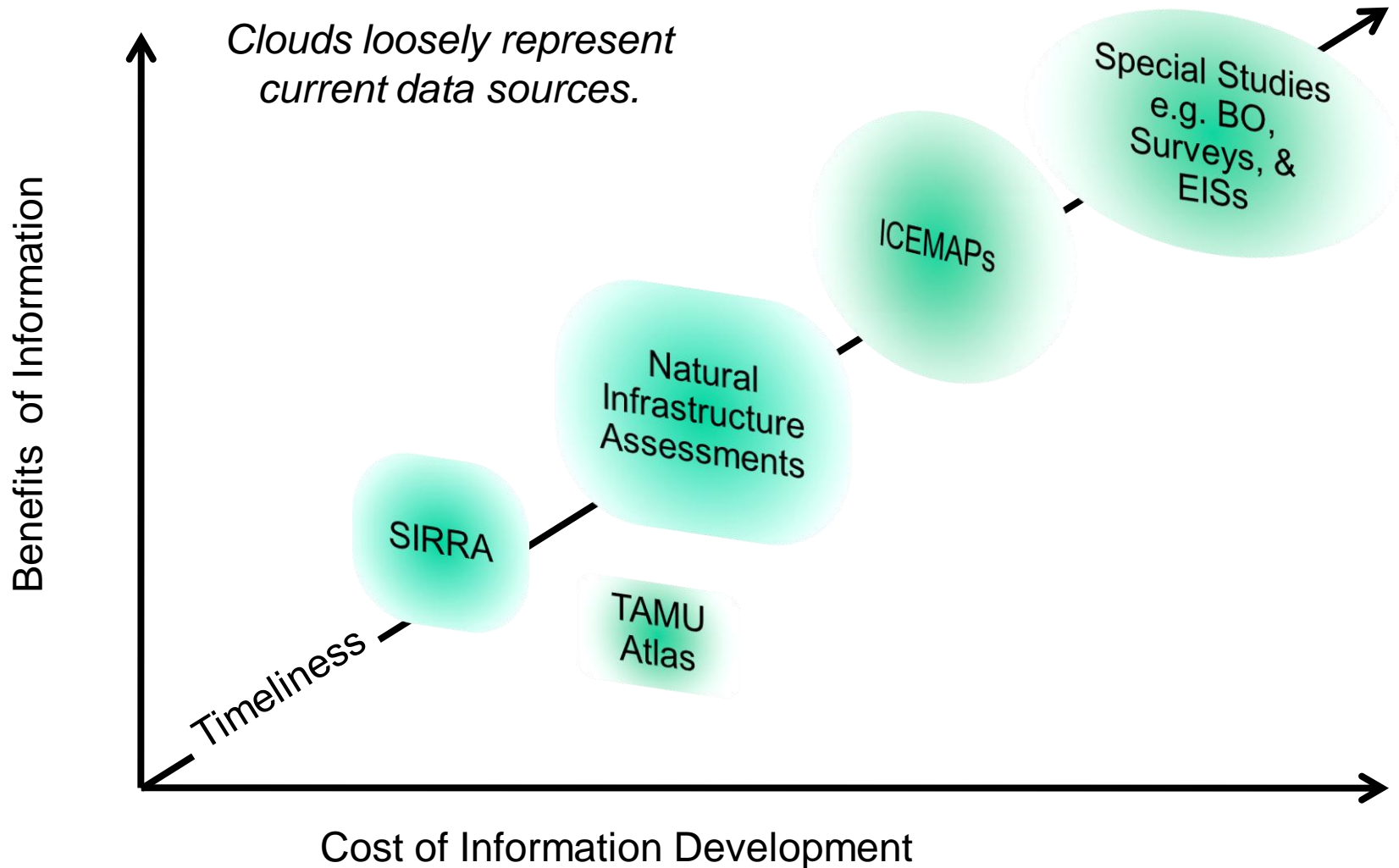
- SIRRA (web-accessible database by CERL)
- Military Installations in Texas: An Atlas
- Selected AF Environmental Impact Statements
- INRMP/ICRMP
- 366 Report to Congress
- Natural Infrastructure Assessment (NIA)

M-D Additional

- Service Encroachment Control Plans
- Guam Compatibility Sustainability Study and OEA Defense Community Profiles 2009
- 2005 BRAC Files
- Web Search for sustainability assessment systems
- *Sustainability Assessment of a Military Installation (SERDP) and Developing Headquarters Guidance for Army Installation Sustainability Plans (RAND)*
- Military family support sites (QOL)
- Defense Critical Infrastructure Guidance and documents



Cost v Benefits v Timing



Data Characteristics and Sources

Characteristics

- Relevant to decision process
- Available on scale that is useful
- Current (and kept current)
- Accurate
- Comparable among installations
- Uses a known metric
- Authoritative source
- Verifiable
- Cost-effective to obtain and evaluate

Sources

- Federal Agencies: US Census, USGS, EPA, NOAA, DoD....
- Commercial
 - GIS: ESRI, PolicyMap, EarthData, Imagenet....
 - Utilities: Energy, water, telecom
- State Agencies
- Regional Councils
- County Planning Authorities
- Other



Identify Key Factors through Consultations

- Visit Selected Installations
 - Langley AFB
 - Homestead Air Reserve Base
 - Buckley AFB
 - Patrick AFB
- Visit Selected MAJCOMS
 - ACC
 - AFSPC
- Establish a Headquarters Encroachment Management Committee/Working Groups
- External Sustainability Subject Matter Expert Workshop
- USACE Civil Engineering Research Laboratory (Completed)

Information Relationships

- **Air Force Core Functions - 12**
- **Category Groupings - 10**
- **Sustainability Factors within the groupings – 41**
- **Factor Score or Indication - 6**



Air Force Core Functions

- **Nuclear Deterrence Operations**
- **Air Superiority**
- **Space Superiority**
- **Cyberspace Superiority**
- **Global Precision Attack**
- **Rapid Global Mobility**
- **Special Operations**
- **Global Integrated ISR**
- **Command and Control**
- **Personnel Recovery**
- **Building Partnerships**
- **Agile Combat Support**



■ **Category Groupings**

- **Military Operations – 4 Factors**
- **Spectrum – 2 Factors**
- **Resources – 5 Factors**
- **Extreme Events – 5 Factors**
- **Land Use Regulations – 5 Factors**
- **Support Capacity - 7**
- **Transportation and Access - 2**
- **Supply – 4 Factors**
- **Community Relationship – 4 Factors**
- **Trends – 3 Factors**



List of Factors Under Consideration

■ Factors

- Development Inside 65 DNL Noise Contour
- Incompatible Development in CZ/APZs
- Obstructions – Imaginary Surfaces around airfields
- Obstructions – Other
- Spectrum Interference – EMI
- Spectrum Interference – Physical
- Electric Energy Reliability
- Military Highway System
- Commercial Airport Proximity
- Water Supply
- Receiving Water Quality
- Threatened and Endangered Species
- Air Quality

■ Factors (con't)

- Schools Availability and Capacity
- Schools Quality
- Housing Availability
- Hurricanes
- Lightning Density
- Sea Level Rise (Climate Change)
- Seismic Activity
- Tornadoes
- Local Govt Regulated Land
- State Govt Regulated Land
- Federal Govt Regulated Land

■ Factors (con't)

- Native American Regulated Land
- Unregulated Land
- Small Businesses
- Skilled Trades
- Technical Schools
- Universities
- Local Ex Officio Membership
- Media Monitoring
- MOU w/ Local Police & Fire Departments
- MOU/Membership with Regional Councils
- Economic Index
- Population Growth Rate
- Unemployment Rate



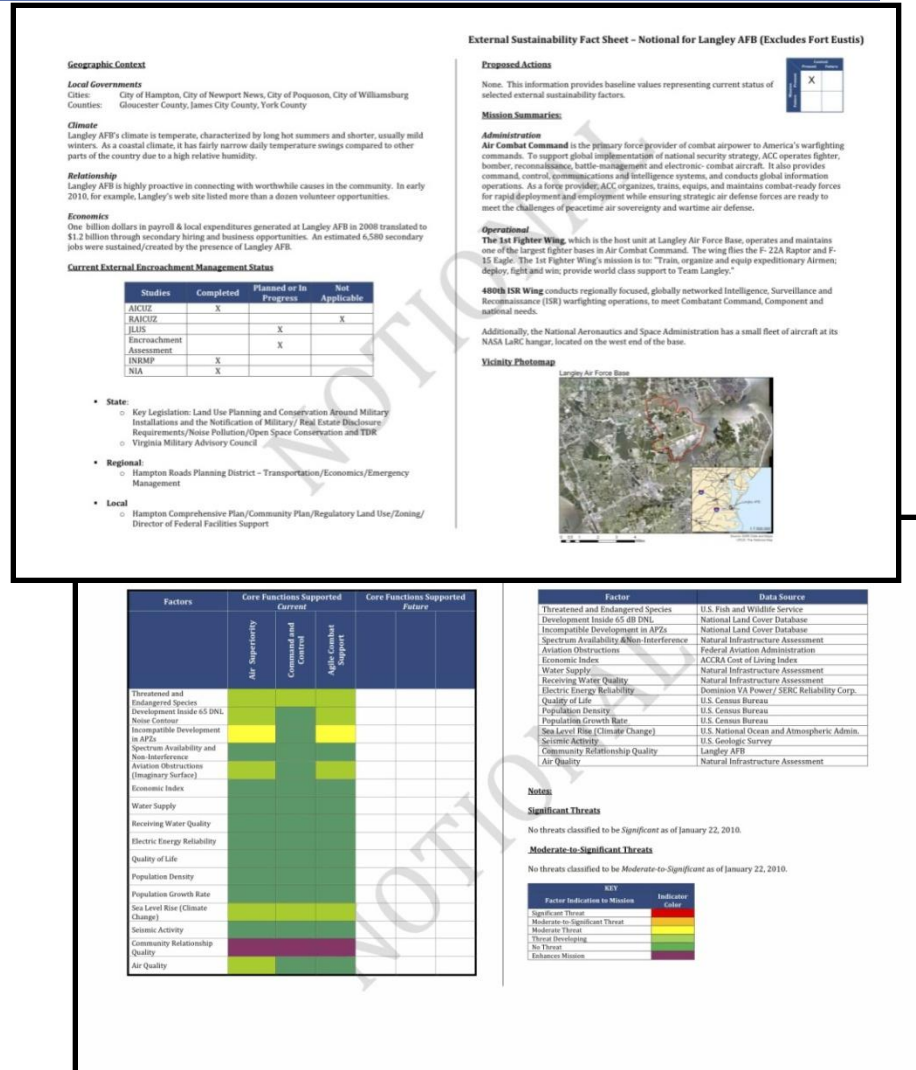
Factor Indications

- Identify the factor potential to affect the AF action
- Looks at negative and positive outcomes

KEY	
Factor Indication to Mission	Indicator Color
Significant Threat	Red
Moderate-to-Significant Threat	Orange
Moderate Threat	Yellow
Threat Developing	Light Green
No Threat	Green
Enhances Mission	Purple

Prototype Installation Fact Sheet

- Display Requirements
 - A satellite map of the installation, with both an internal and external view.
 - Geographic context of the installation.
 - A description of the installation mission.
 - Risk Assessment table for each mission currently undertaken at the installation.
 - Discussion of current encroachment monitoring and management efforts at the Installation .
 - Summary of datasets used to conduct analysis.
- Uses an atlas layout approach
- Eventually must translate into a Heads Up Display





Key Outcomes

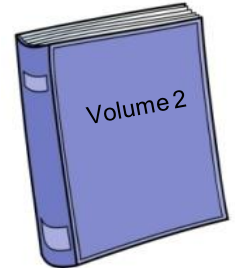
Volume 1

- Introduction
- Executive Summary
- Installation Fact Sheets
 - Geographic setting
 - Mission description
 - Factor evaluation table
- Supporting Documentation
 - Data sources
 - Installation-specific analysis



Volume 2

- Introduction
- Factor Selection
- Factor Scaling
- Factor Scoring by Mission
- Installation Selection
- Lessons Learned
 - Level of effort
 - Data characteristics encountered
 - Limitations to methodology
- Way Ahead



- Volume 1 demonstrates evaluation of factors for selected installations
- Volume 2 discusses project purpose, methodology and lessons learned



Early Challenges

- Identifying which external factors have highest value to AF to ensure greatest return on level of effort
- Rating levels of factors consistently in a way that
 - Can be accurately understood
 - Allows meaningful comparisons of installations
- Defining region of influence in a manner that is comparable among installations
- Obtaining data appropriately scaled to the vicinity of installations
- Ensuring that the tool will be used where envisioned (buy-in).
- Ensuring that the efforts mesh constructively with related efforts, such as NIA, AICUZ, JLUS



■ **Topical Areas**

- **Noise and Safety Compatibility Criteria for Ranges and Air Space: Choice of Land Use Categories**
- **Alternative Energy Impacts on Ranges and Airspace**
- **Purpose is to initiate an AF encroachment research effort and solve AF problems simultaneously**
- **Pursue RDTE and policy research**
 - **Air Force and Army laboratories**
 - **SERDP/ESTCP**
 - **Air Force Academy, Senior War Colleges, FFRDCs, and Science Board**



Conclusion

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